Towards Frameworks for Standardising Recordkeeping Metadata

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In electronic networked environments, IT professionals, librarians, information managers, cultural heritage players, recordkeeping professionals and other stakeholders are working together to develop coherent information architecture and metadata regimes to support document management, document discovery and document delivery. National and international efforts aim to build a global infrastructure of rules and standards in the virtual world equivalent to the regimes which manage recorded information in the paper world. The main drivers thus far have related to improving information resource identification, discovery and delivery to support information sharing and knowledge transmission via electronic networks populated by ever increasing numbers and varieties of document-like information objects (DIOs). New imperatives relate to supporting the transaction of business via distributed networks with the growth of electronic commerce. This article focuses on Australian research which addresses recordkeeping metadata regime requirements relating to the transaction of business in networked environments, as well as information sharing and knowledge transmission. Existing and proposed projects to develop and implement frameworks for standardising and managing recordkeeping metadata are outlined with reference to related international and national developments in the broader information community, including the development of common core sets of metadata and frameworks that support interoperability. Particular reference is made to the Australian Government Locator Service (AGLS), which aims to develop a consensus on metadata regimes to help manage and make accessible Australian government document-like information objects in distributed networked environments. The conceptual basis of the Australian research in records continuum thinking is also explored.[1]

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Introduction

> Information resources in networked environments need to be adequately identified, authenticated and quality rated. They need to be readily accessible and retrievable for as long as they are required, then to be disposed of in a systematic way. Terms and conditions of access and disposition need to be managed and monitored [...] Effective control of all document-like information objects or DIOs depends in part upon authoritative metadata – accurate information which specifies their structure, content, context and essential management requirements – being embedded in, wrapped around or otherwise persistently linked to each individual DIO to attest to its nature and quality. Thus accurate metadata is increasingly seen as the tool which will enable users to discover, distinguish, select and use authentic, authoritative information resources and records.[2]

In the virtual world of cyberspace, systems which parallel rules and protocols we are familiar with in the paper world are beginning to emerge. The need to devise metadata-based regimes to authenticate, protect, manage and make accessible DIOs in networked environments is being given urgent attention by international and national communities.

As well as the increasing opportunities for information accessibility and transmission of knowledge in distributed networked environments, there is also seemingly unlimited scope for the transaction of business of all kinds. In Australia, for example, the Commonwealth government has committed itself to deliver all appropriate services electronically via the Internet by 2001. A related initiative is the establishment of electronic commerce as a normal means for Commonwealth payments by the year 2000.[3] This will involve radically different ways of structuring service provision and business processes. New approaches to managing records will be needed to support business activities in cyberspace:

> At present organisations seeking to do business through distributed networked environments are exposed to considerable recordkeeping-related risk. Minimising this risk for government, organisations and individuals involves establishing reliable and robust mechanisms
>
> - to enable the continuing accessibility of essential evidence
> - to ensure that the accountability protections provided by the electronic record persist over time.[4]

Minimising the risk in part involves building frameworks for attributing and managing metadata in these environments. A key component of such regimes is the use of standard metadata elements, embedded in, encapsulating or persistently linked to the records.

Managing records effectively in distributed networks also involves ensuring that recordkeeping metadata regimes are compatible with the metadata development framework initiatives in the broader information community, such as:

- The definition of generic metadata sets and cross sectoral frameworks for all document like information objects through initiatives such as the Dublin Core metadata set and Warwick framework;
- The development of specific sectoral metadata sets which map to and extend the generic specifications to serve particular functionality, e.g. the Australian Government Locator Service metadata set which aims to promote government information discovery and delivery.

The Australian recordkeeping metadata research described in this paper aims to contribute to the establishment of the 'reliable and robust mechanisms' referenced above. And, like other related initiatives, it seeks to advance understandings of concepts like authenticity, integrity, persistence, and uniqueness, bringing recordkeeping perspectives to the broader endeavours in this area.

The following sections of the paper will address a range of issues relating to this research:

- What is recordkeeping metadata? Why do we want to standardise it?
- What is the SPIRT Recordkeeping Metadata Project all about? How will another proposed project, 'Metadata architecture to support persistence of essential evidence of business, social and cultural activity in distributed networked environments', extend the work of the SPIRT Project?
- What is the conceptual basis for the Australian recordkeeping metadata research?
- What is the relationship between the SPIRT Project and other national and international metadata-related developments, particularly the Australian Government Locator Service initiative?

What is recordkeeping metadata?

The way in which recordkeeping metadata is defined in the SPIRT Recordkeeping Metadata Project is related to evolving understandings of 'description' in records continuum thinking. The term description is used in records continuum thinking to label a very broad concept. This concept is not set up as an alternative to traditional definitions of archival description. It does not focus on either the 'front end' or the 'back end' of the records life cycle. Rather it encompasses and extends traditional definitions with reference to the whole of the records continuum.

Description in the Records Continuum

The concept of description in the continuum relates to a complex multi-layered recordkeeping function that is carried out through a series of parallel and iterative processes that capture and manage 'recordkeeping metadata'.

Recordkeeping metadata is also defined broadly to include all standardised information that identifies, authenticates, describes, manages and makes accessible documents created in the context of social and business activity. Recordkeeping metadata so defined has traditionally been captured and managed in both recordkeeping systems and archival control systems.

Description-related processes begin at or before records creation and continue throughout the lifespan of the records. Their primary aim is to provide the intellectual controls that enable reliable, authentic, meaningful and accessible records to be carried forward through time within and beyond organisational boundaries for as long as they are needed for the multiple purposes they serve.

The way description is conceptualised within continuum thinking enables exploration of the relationship between:

- registration, classification and other recordkeeping processes in current recordkeeping systems; and
- the documentation of recordkeeping systems and their contexts of creation and use in archival control systems

both historically and in our cyberspace future. It opens up questions about where and when recordkeeping metadata might be captured and managed in electronic systems in distributed networks.

To give an idea of the scope of this definition of recordkeeping metadata, let's look at an historical example. Professor Neumayer was a Bavarian scientist who visited Victoria in the 1850s. His business dealings with the colonial government relating to the building of the Melbourne Observatory are documented in the inwards and outwards correspondence of the Chief Secretary. The recordkeeping metadata linked to these letters is detailed below.

Metadata Associated with Documentation of Professor Neumayer's Dealings With the Colonial Government of Victoria Relating to the Melbourne Observatory.[5]

- Chief Secretary's registers and indexes: provide registration, classification, content and context metadata, recordkeeping process metadata, use history, and retrieval metadata.
- Inwards letters and outwards letter books: annotations on letters and dockets constitute metadata about immediate business context, specifically the business processes in which the documents were agents of action.
- Physical form, ordering and juxtaposition: constitute structure metadata.
- PROV (Public Record Office Victoria) series system: provides broader contextual and archiving process metadata, including metadata relating to contexts of creation and use, recordkeeping systems, and relationships between and amongst context and records entities, and metadata about access terms and conditions, conservation action and disposal status, and physical location.
- PROV Summary Guide: includes metadata drawn from the series system and discovery/retrieval metadata.

There has been a tendency to mystify the concept of metadata within the records and archives world. The term metadata itself is borrowed from our IT colleagues and has come to mean many things to many people. It is clear from the SPIRT Project definition that recordkeeping and archival control systems have always been all about capturing and managing recordkeeping metadata.

Traditionally some kinds of metadata, e.g. relating to records' content, structure and aspects of their immediate business context, management and use, have been captured and managed in current recordkeeping systems. Other kinds of metadata, e.g. information about the broader contexts of recordkeeping and archival processes, have been captured and managed in archival control systems. Some metadata has been present in the physical form, ordering, juxtaposition and location of the records themselves.

As we see in the above example, the Chief Secretary's 19th century docketing system captured and managed metadata about records' content and structure, and some context and recordkeeping process metadata. The associated registers and indexes ('control records') captured and managed more extensive metadata about business and recordkeeping processes, and the use of the record. The archival control system at the Public Record Office Victoria has captured and managed descriptive metadata about the Chief Secretary's recordkeeping system, its provenance and relationships to other records, as well as metadata about archival actions relating to the records in the system.

Much content and structure metadata in paper systems like the Chief Secretary's is captured and represented in the physical form of the documents themselves. Some context metadata is also captured and represented physically, e.g. by the physical placement of an inwards letter in a docket, the attachment of two pieces of related correspondence together, the physical ordering of folios, or the physical location of a records series in a registry or in the archives. In these systems physical location and custody carry contextual meaning. The associations thus made, e.g. between the documents that make up a record, between records of related transactions, or between records and their creator, reflect what today we would call logical associations.[6]

In a paper world, as Chris Hurley has explored for us, a lot of broad contextual metadata is carried in the minds of users while the records remain in the organisation that created them. Like the records, users are located inside an organisation – the users know *where* they are and that defines the broader organisational context of the records for them. The contextual knowledge brought to the record by 'insiders' includes information about organisational and functional provenance, the recordkeeping system itself and relationships between records. Physical ordering and location in a paper paradigm have also been *partial* evidence of the business process and its organisational context. Moreover requirements for the unique identification of records need only be satisfied within the local domain in which they are created.

When paper records move beyond the boundaries of the organisation or local domain in which they are created, then broader contextual metadata needs to be captured and the requirement for unique identification needs to be extended to satisfy the demands of a global domain. Typically such needs have come into play in the past when records are transferred to an archives repository (a global domain). If these needs are not met, 'outsiders' will not be able to uniquely identify, retrieve and understand the meanings of the records.[7]

The Australian series system has always had the capacity to document the broader contexts of recordkeeping *both* contemporaneously and historically. And the series system is able to deal with the intellectual control and management of records that will never be in the physical custody of the National Archives.

> Scott's approach was to move away from describing records in the custody of an archival institution and arranged there into a single group for a single records creator, and to move towards describing the multiple interrelationships between numerous creators, and numerous series of records, wherever they may be: in the office(s) of creation, in the office of current control, or in the archives [...] Scott's fundamental insight broke through not just the straight-jacket of the record group, but all the 'physicality' of archives upon which the record group and so many other approaches to archives are implicitly based. In this way, as is finally being acknowledged, Peter Scott is the founder of the post-custodial revolution in world archival thinking. Although he worked in a paper world, his insights are now especially relevant for archivists facing electronic records, where – just as in Scott's system – the physicality of the record has no importance compared to its multi-relational contexts of creation and contemporary use.[8]

In cyberspace physical location may cease to carry meaning; physical boundaries break down; the distinction between insiders and outsiders based on physical location becomes less significant in relation to using records. Records in electronic networks may be managed from their creation in global rather than local domains. In electronic systems, in particular in distributed networks, it may be essential for much of the metadata that has been traditionally captured in archival control systems to be present in – or available to – current recordkeeping systems.

In order to uniquely identify, manage, retrieve and understand the meaning of records in the global domains of cyberspace, it becomes essential to:

- make what was before at least partially evident through physical formatting, ordering and location (custody) explicit in metadata captured in current recordkeeping systems, or knowledge bases linked to them;
- document fully the logical associations that derive from the role records play in business processes and their contexts;
- consider capturing and managing the broader contextual metadata, traditionally found in archival control systems, in current recordkeeping systems – or devising ways of linking more closely the metadata in archival control systems to current recordkeeping systems.

Standardising metadata for recordkeeping purposes

Recordkeepers, records managers and archivists have always managed metadata for the recordkeeping purposes identified below.

Recordkeeping Metadata Purposes

- Unique identification
- Authentication of records
- Persistence of records content, structure and context: by fixing their content, ensuring that their structure can be re-presented, and maintaining sufficient organisational and functional context to preserve their meaning over time and beyond their context of creation
- Administering terms and conditions of access and disposal
- Tracking and documenting use history, including recordkeeping and archiving processes
- Enabling discovery, retrieval and delivery for authorised users
- Restricting unauthorised use

However, they are only beginning to come to terms with the need in distributed networked environments to assure interoperability so that records can be identifiable, searchable, retrievable, useable, available and restrictable through common user interfaces. It is this imperative that drives efforts to standardise recordkeeping metadata.

The Strategic Partnership with Industry – Research & Training (SPIRT) Recordkeeping Metadata Project

The 1998 Strategic Partnership with Industry – Research & Training (SPIRT) Support Grant, 'Recordkeeping metadata standards for managing and accessing information resources in networked environments over time for government, social and cultural purposes', aims to provide a framework for standardising sets of recordkeeping metadata that can be attributed to records from their point of creation, e.g. by embedding, encapsulation or linking to metadata stores. The Project is jointly funded by the Australian Research Council and the industry partners: National Archives of Australia, Archives Authority of NSW, Queensland State Archives, Records Management Association of Australia, and the Australian Council of Archives.

The Project Team includes:

- Sue McKemmish, Chief Investigator, Monash University;
- Ann Pederson, Chief Investigator, University of New South Wales;
- Steve Stuckey, Partner Chief Investigator, National Archives of Australia;
- David Roberts, Archives Authority of New South Wales;
- Lee McGregor, Queensland State Archives;
- Dennis Wheeler, Records Management Association of Australia;
- Gavan McCarthy, Associate Investigator, Australian Council of Archives and Australian Science Archives Project;
- Glenda Acland, Research Consultant;
- Luisa Moscato, Researcher, National Archives of Australia;
- Kate Cumming, Australian Postgraduate Award (Industry) holder.

Consultation and communication strategies are currently being put in place, including:

- a Web site
- a network of stakeholders comprising
  - experts in records and archives and related areas
  - major clients and users of recordkeeping and archival services
  - Australian and international researchers
  - software developers and vendors
  - the Australian and international recordkeeping community
  - the wider information and metadata community
- processes for consultation and validation.

The objectives and methodology of the SPIRT Recordkeeping Metadata Project are outlined in the following table.[9]

Project Objectives

- to codify, i.e. specify and standardise, the full range of recordkeeping metadata needed to manage records in electronic networked environments to meet current and future requirements for access to essential evidence
- to classify metadata elements according to their role in managing records to support decision making about what metadata to capture, and to assist in managing related risks i.e. to enable people to make business cases about what level of functionality to build into their recordkeeping systems based on considerations like:
  - * how robust does this record need to be?
  - * does it have to persist over long periods of time?
  - * how sensitive are related terms and conditions re. access and use?
  - * how important is it to track and document its use?
- to support interoperability with generic metadata standards, e.g. the Dublin Core and other sector-specific sets
- to support initiatives in relation to information locator systems, e.g. the Australian Government Locator Service

Project Methodology

- Define functionality required with reference to national and international projects, e.g. Chris Hurley's work on the *Australian Common Practices Manual*, and the University of British Columbia and University of Pittsburgh projects[10]
- Specify metadata sets captured in or associated with records in Australian recordkeeping and archival systems, e.g. registry systems, automated records and archival management systems, Australian series systems

- Analyse specifications to determine what functionality different types of metadata supports in relation to the dot points referenced above:
  - * identification
  - * authentication
  - * persistence
  - * administration of access and disposal terms and conditions
  - * documentation of use history/RK processes
  - * discovery, retrieval and delivery
  - * restrictability
  - * interoperability
- Identify matching elements, redundancies and gaps
- Specify additional metadata
- Develop standardised Australian recordkeeping metadata set with guidelines for use, including the use of schemes, e.g. the Keyword AAA Thesaurus, qualifiers, extensions and syntax
- Validate and develop strategies for promulgating recordkeeping metadata standards (possibly through the Standards Australia framework)
- Classify standardised set in terms of functionality
- Map set against selected generic and sector specific sets, e.g. AGLS, Dublin Core, archival descriptive standards

A research project, 'Metadata architecture to support persistence of essential evidence of business, social and cultural activity in distributed networked environments', is currently the subject of an Australian Research Council Large Grant Application (Chief Investigators Barbara Reed and Sue McKemmish). The proposed research would build on and extend the work being undertaken in the SPIRT Project. In particular it would address implementation frameworks for managing the dependencies of meaning and contingent nature of metadata in recordkeeping systems over time.

The conceptual basis of Australian recordkeeping metadata research in Records Continuum thinking

The frame of reference for Australian recordkeeping metadata research is records continuum thinking and practice as it has evolved in Australia over the last half century.

One of the keys to understanding the Project's approach to what metadata needs to be captured, persistently linked to documentation of social and business activity, and managed through time and space, lies in the continuum view of records. In continuum thinking, they are seen not as 'passive objects to be described retrospectively', but as agents of action, 'active participants in business processes and technologies'.[11] This way of envisaging records has implications for the wider information world of cyberspace:

> Much of the initial thinking about documents on the Internet involved a translation of the paper paradigm. Paper minds see records and other information objects as passive things to be acted upon, rather than as active participants in business processes. In the networked environment and the newly emerging information paradigms, the document-like information object can itself become the agent of action. A simplistic passive notion of DIOs which sees them as existing only to provide and disseminate information will not further the requirements of organisations, government and individuals for information objects which can act as the transactors of business. The recordkeeping perspective links the dynamic world of business activity to the passive world of information resource.[12]

Another key to the approach being taken in the project is found in the way description is conceptualised in continuum thinking. A narrow traditional view of description is provided in *Keeping Archives*:

> Description is the process of recording standardised information about the arrangement, contents and formats of the records [in archival custody] so that persons reading the descriptions will be able to determine whether or not the records are relevant to their research.[13]

As discussed earlier in the paper, a records continuum view of description takes a much broader perspective. According to the continuum view, the process described above is but one in a series of descriptive processes that might be applied to records, and the purpose ascribed to it but one of the many purposes of description. The Australian series system has always embodied a much more

complex view of the archival description function than that presented in *Keeping Archives.*

Although it is possible to limit the use of the series system to the description of records in custody, a fully implemented series system is capable of documenting current and historical recordkeeping systems and their contexts of creation and use, contemporaneously and over time. The development of the CRS system in the National Archives was based on a broad view of the purposes of archival descriptive systems:

> The CAO [Commonwealth Archives Office] defined its role as a defender of the record in terms that went beyond the physical custody of old records to address the broader notions encompassed by the Oxford Dictionary's definition of custody as 'safekeeping; protection; defence; charge; care; guardianship'. It looked to exercise these responsibilities across the recordkeeping continuum, i.e. in relation to recordkeeping processes from the time of records creation. At the same time, it was carving out a place for itself in the management of Commonwealth records generally. It therefore needed an archival information system that would support its programs of intervention in relation to current recordkeeping processes in Commonwealth agencies, as well as its programs for managing records already in repositories.
>
> Thus, the development of the CRS system reflected a view of the purposes of an archival system which went beyond the arrangement and description of records in the physical custody of the archival authority and incorporated the type of information needed to manage the disposal of unwanted records from current recordkeeping systems, to assure the transmission of records of continuing value from agency systems of control to archival control, and to manage subsequent archival program action, e.g. conservation or administration of access.[14]

In continuum thinking, description has evolved into an even broader concept.[15] It encompasses recordkeeping processes that capture and inextricably link authoritative metadata to documents created in the context of social and business activity from the time of their creation and throughout their lifespan. As previously outlined, here metadata is defined as standardised information about the identity, authenticity, content, structure, context and essential management requirements of records. The management requirements referenced could relate to the administration of access terms and conditions, the implementation of restrictions on unauthorised use, the tracking of 'use history', including the documentation of disposal, migration and retrieval action, or the enabling of discovery and delivery.

If archival description is defined as the post-transfer process of establishing intellectual control over archival holdings by preparing descriptions of the records, then those descriptions essentially function as cataloguing records, surrogates whose primary purpose is to help researchers to find relevant records. In the continuum, archival description is instead envisaged as part of a complex series of recordkeeping processes, involving the attribution of authoritative metadata from the time of records creation. Such a view of archival description is radically different from that which informs most international initiatives to standardise archival descriptive metadata, just as the Australian series system represents a very different approach to the intellectual control of records than archival descriptive systems in other countries.

Chris Hurley has summed up the implications of the continuum view of description thus:

> Descriptive metadata itself carries meaning. It is not simply a key to unlocking the meaningful data contained in an electronic record. Because descriptive metadata is more than a picture or representation of a record, because it documents recordkeeping processes and contextual knowledge, it can be conceptualised as part of the record itself.[16]

The SPIRT Recordkeeping Metadata Project and the Australian Government Locator Service

Information locator systems provide knowledge structures for representing, identifying, locating and delivering information resources, including records.

The National Archives of Australia has been designated lead agency for the development of the Australian Government Locator Service (AGLS), an outcome of the work of the Information Management Steering Committee of the Office of Government Information Technology. This committee has proposed frameworks for government information policy and the deployment of technology into the 21st century.[17]

The objectives of AGLS relate to promoting the visibility, accessibility and interoperability of government information, enabling individuals and organisations to transact business electronically with government agencies at all three levels, and supporting the related initiatives in the *Investing for Growth* package.

A key part of the AGLS is the promulgation of a standard set of metadata to be attributed to all Australian government documents made accessible in distributed networks.[18] The AGLS set adopted the fifteen Dublin Core elements and added two additional elements, functional descriptor and availability.

AGLS Elements
(Dublin Core plus 2*)

Title	Contributor	Source
Creator	Date	Language
Subject	Type	Relation
Description	Format	Coverage
Publisher	Identifier	Rights
Functional Descriptor*		Availability*

The Dublin Core initiative aims to establish a generic metadata set to be applied to all DIOs on the Internet.[19] This core set is designed to be embedded or persistently linked to individual document-like information objects. Its primary objectives relate to information resource identification, discovery and interoperability, i.e. improving search capability in global networks.

Though intentionally minimalist, the Dublin Core set is also designed to be 'extensible'. This means that each of its fifteen elements can be extended by adopting specialised sets of metadata elements to provide more information. For example, the basic subject element could be extended by using Library of Congress subject headings, provided these were standardised in such a way that they were Dublin Core compliant. An associated project is the development of the Warwick Framework in which generic and cross-sectoral specific metadata sets can be applied.

As mentioned above, the AGLS metadata set extended the Dublin Core set by two elements, functional descriptor and availability. The functional descriptor was considered an essential element in a set that will be attributed to information

resources that comprise significant quantities of records. The *Keyword AAA Thesaurus* (a whole-of-government administrative function based thesaurus, developed by the Archives Authority of NSW, and being customised for use by Commonwealth Government agencies) and agency Functions Thesauri can be a source of descriptor terms for the AGLS functional descriptor metadata element. The availability element was added as the purposes of the AGLS stretch beyond document discovery (the primary focus of the Dublin Core) to encompass document delivery.

Related projects, under the auspices of AGLS, relate to the development of a common entry point for all Australian government information (Commonwealth, State and Local), and of search engines to exploit the contextual metadata associated with them.

The Australian metadata community is also exploring how the metadata specified in standardised sets can be associated with information objects, e.g. through the Metaweb project of the National Library of Australia. Associating metadata with information objects can occur by embedding it within a document, through linking objects to separate metadata stores, or by encapsulating the document with metadata. The Distributed Systems Technology Centre, DSTC Pty Ltd, is also involved in a range of projects that are relevant to metadata related research and development initiatives.[20]

It is envisaged that the AGLS scheme will operate in a decentralised manner and that government agencies will assign AGLS metadata at aggregate and item/object level, manage that metadata, and make it available to web based search engines for retrieval. Tenders for the writing of an AGLS Manual have been released and a Pilot Project is evaluating the ease with which the metadata can be created, captured, managed and migrated. The Pilot will also collect data on technologies employed by agencies to implement AGLS.[21]

At the conception of the AGLS scheme it was recognised that a high proportion of information resources described or required online to support Internet based government services and transactions would be records. That is, in many cases AGLS metadata would be assigned to government records.

It was also recognised that the prime purpose of assigning AGLS metadata was to enable resource discovery and resource retrieval by authorised users, two of the functions also required of a recordkeeping system. Hence AGLS metadata assigned to records should theoretically be a subset of any standardised metadata set specified for recordkeeping purposes.

The SPIRT project aims to specify metadata for all of the functions required of recordkeeping systems. As the AGLS project preceded SPIRT, it was not possible for AGLS to be influenced by SPIRT findings. However it is important that as the SPIRT initiative proceeds it assesses AGLS to ensure that the metadata specifications for functional requirements common to AGLS and SPIRT are similarly represented.

Such compatability would ensure that at document creation, the AGLS metadata could be captured as part of the recordkeeping metadata capture process. The AGLS component could then be managed within a recordkeeping system and stripped off if need be in order to be associated with information objects available via the Internet.

The AGLS initiative recognises that agencies may wish to employ technology options other than recordkeeping systems for the creation and management of AGLS metadata. Nevertheless whatever technology option is chosen, the metadata requirements for AGLS and the resource discovery and retrieval components of the metadata specification arising out of SPIRT should be close.

Conclusion

Australian recordkeeping metadata research aims to develop metadata management regimes that will meet organisational, social and cultural needs for:

- The creation and management of records in networked environments;
- Making records accessible with an array of other genres of recorded information through common user interfaces;
- Records to continue to function over time and space - for a nanosecond or millennia:

- as evidence for governance, accountability, memory and identity purposes – their raison d'etre
- as sources of value-added information - information that can be accessed, exploited and reused for reasons unrelated to the business or social activity they document.

Without such regimes to support business activities in distributed networks and facilitate information accessibility and knowledge transmission:

> Society, government, commerce and individuals will not be able to continually access the information they need to conduct their business, protect their rights and entitlements, and securely trace the trail of responsibility and action. Lack of attention to the frameworks for implementing systems which attribute and manage the metadata associated with records will provide a barrier to capitalising on technological innovation. Failure to maintain authentic, reliable and useable evidence of transactions will also have significant social and cultural implications. Records are a bastion of democratic and cultural accountability. They enable democratic rights of review and examination, and the transmission of our cultural heritage. Such rights have been increasingly protected in legislative mandate. Without the appropriate frameworks for the creation and management of electronic resources in the networked environment equivalent to those well established in the paper world, society will be unable to exert these rights and the cultural record of endeavour will be lost by default.[21]

In order to achieve our goals, we must understand the 'dynamic nature of the record as an active participant in business processes and technologies over time', and 'the integral relationship between documents recorded in the context of social and business activity and their identifying and enabling metadata'.[22] Furthermore we must link our Australian recordkeeping metadata initiatives to metadata-related developments in the broader information community, drawing on, and contributing our recordkeeping perspectives to, national and international efforts to build a global infrastructure of rules and standards for information management in the virtual world. Records continuum thinking provides a holistic framework for meeting the enormous challenges involved in devising recordkeeping metadata regimes to manage records and their meanings through time in complex, inter-related and rapidly co-evolving cultural, socio-legal, technological, functional and organisational environments.

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Endnotes

1 This article is based on a paper originally prepared by Sue McKemmish for the Working with Knowledge, International Conference on Archives, Canberra, 6-7 May 1998. Dagmar Parer contributed the section relating to the Australian Government Locator Service.

2 Application for Strategic Partnership with Industry – Research and Training (SPIRT) Support in 1998, 'Recordkeeping metadata standards for managing and accessing information resources in networked environments over time for government, commerce, social and cultural purposes', Chief Investigators Sue McKemmish and Ann Pederson, Partner Chief Investigator Steve Stuckey, May 1997.

3 *Investing for Growth*, <http://www.dist.gov.au/growth/html/infoage.html>

4 1999 Large Research Grant Application, 'Metadata architecture to support persistence of essential evidence of business, social and cultural activity in distributed networked environments', Chief Investigators Barbara Reed and Sue McKemmish, February 1998.

5 The 1857 correspondence between Neumayer and the Chief Secretary is captured and documented in: VPRS 1189 Inwards Correspondence of the Chief Secretary's Office, Unit 744, 1857/8840, Letters re the Observatory; VPRS 1187 Register of Letters Sent, 1857; VPRS 1186 Inwards Correspondence Registers, 1857; VPRS 1411 Index to Letters Received, 1857; VPRS 1188 Index to Letters Sent, 1855-59; Public Record Office of Victoria Series System; Public Record Office of Victoria, *Summary Guide*, 1990

6 As explored further in: Sue McKemmish, 'Are Records Ever Actual?' in Sue McKemmish and Michael Piggott, *The Records Continuum: Ian Maclean and Australian Archives first fifty years*, Ancora Press in association with Australian Archives, Clayton, 1994, pp. 187-203.

7 Chris Hurley explored these issues in the Masters teaching program at Monash University, especially through the distance education subject, LAR 5530 *Managing the Records Continuum*, developed by Sue McKemmish and Frank Upward, with critical inputs from Chris.

8 Terry Cook, 'Archives in the Post-custodial World: interaction of archival theory and practice since the publication of the Dutch Manual in 1898', paper delivered to the XIII International Congress on Archives, Beijing, 1996.

[9] The Project Objectives and Methodology are detailed in the Application and Research Plan for the Strategic Partnership with Industry – Research and Training (SPIRT) Support in 1998 'Recordkeeping metadata standards for managing and accessing information resources in networked environments over time for government, commerce, social and cultural purposes'.

[10] University of British Columbia, 'The Preservation and Integrity of Electronic Records' at <http://www.slais.ubc.ca/users/duranti/> ; University of Pittsburgh, 'Functional Requirements for Evidence in Recordkeeping' project, Business Acceptable Communications model at <http://www.lis.pitt.edu/~nhprc/mea96.html>

[11] For further elaboration of this view, see Barbara Reed's article, 'Metadata: core record or core business', *Archives and Manuscripts*, Vol. 25, No. 2, Nov 1997, pp. 218-41.

[12] 1999 Large Research Grant Application, 'Metadata architecture to support persistence of essential evidence of business, social and cultural activity in distributed networked environments', Chief Investigators: Barbara Reed and Sue McKemmish, February 1998.

[13] Judith Ellis (ed.), *Keeping Archives*, 2nd edition, W. D. Thorpe, Port Melbourne, 1993, Chapter 8, p. 223.

[14] Sue McKemmish, 'Are Records Ever Actual?' pp. 189-90.

[15] The continuum notion of description is being further explored in the Masters teaching programs of Monash University, especially through the distance education subject, LAR 5530 *Managing the Records Continuum*, developed by Sue McKemmish and Frank Upward, with input from Chris Hurley.

[16] LAR 5530 *Managing the Records Continuum*, Topic 10, 1997.

[17] See *Managing Government Information as a National Strategic Resource* at <http://www.ogit.gov.au/publications/IMSC/imscrept.html>.

[18] See the National Archives of Australia site <http://www.naa.gov.au>

[19] See the OCLC site for more information on the Dublin Core and Warwick framework: <http:purl.oclc.org/metadata/dublin_core/>

[20] See the DSTC site <http://www.dstc.edu.au/> for details of these projects, e.g. next generation middleware, flexible configurable workflow prototypes, and global information access.

[21] Since writing, the Manual has been published at www.naa.gov.au/govserv/agls

[22] 1999 Large Research Grant Application, 'Metadata architecture to support persistence of essential evidence of business, social and cultural activity in distributed networked environments', Chief Investigators Barbara Reed and Sue McKemmish, February 1998.

[23] Phrases coined by Barbara Reed and Ann Pederson respectively.